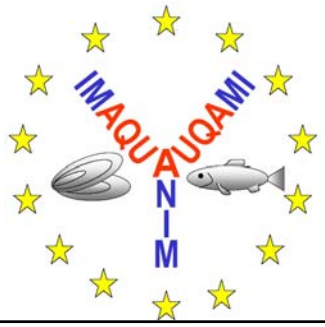
Improved immunity of aquacultured animals

IMAQUANIM

Integrated Research Project
2005-2009
Supported by The European Commission

FP6 priority 5: Food quality and safety.



Improved immunity of aquacultured animals

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Project objectives

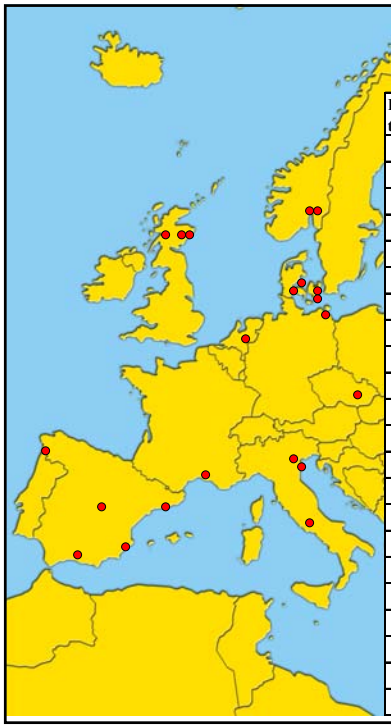
•Development of molecular and immunological tools for typing and monitoring of immunological key components in finfish and shellfish

•Use the developed tools for analysing the immune response profiles following infection, vaccination, and immuno-stimulation.

•Establish a functional relationship between immune response profiles and protective immunity.

•Development of optimal strategies for disease prophylaxis through a well established and well primed immune defence system in the aquacultured animals.

•Training and dissemination.



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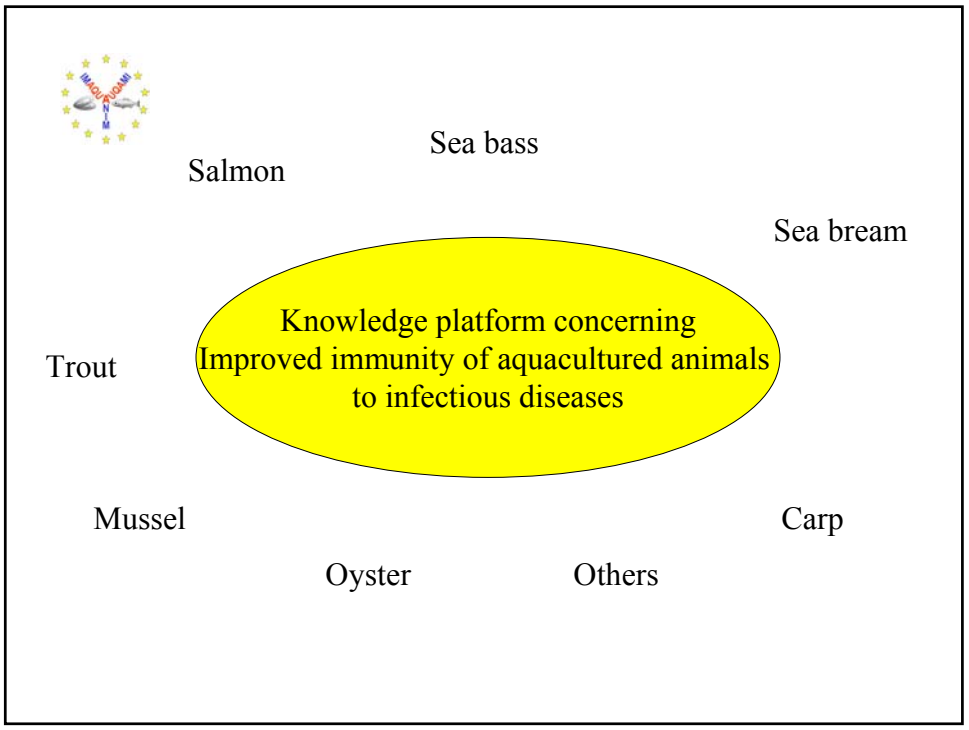


Major blocks of work

1

Disease models
WP1s-2.1

2

Vaccines and
Immunostimulants
WP2.2-2.4

3

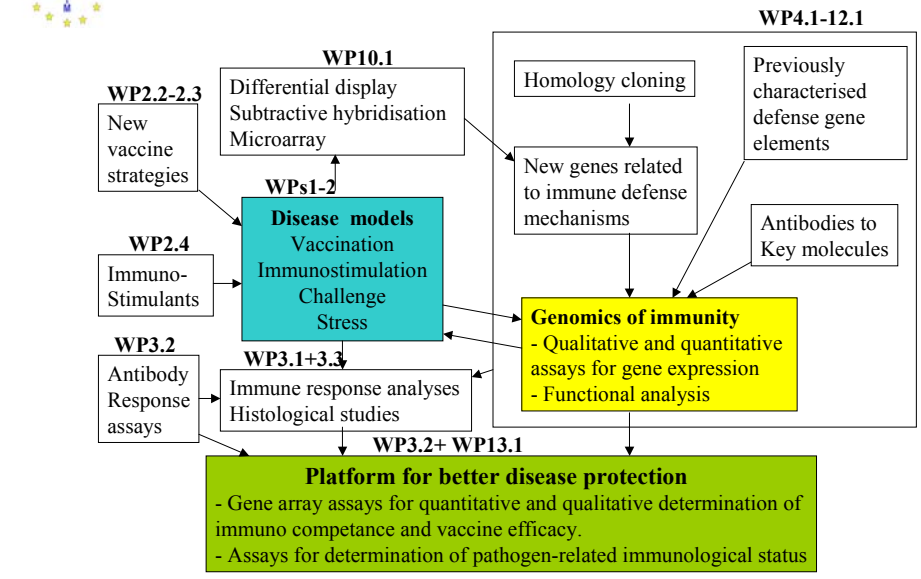
Molecular and functional
Immunology
WP3.1-12.1

4

Tools for typing and monitoring
of the immune system
WP3.3 and WP13.1

Improved immunity of aquacultured animals

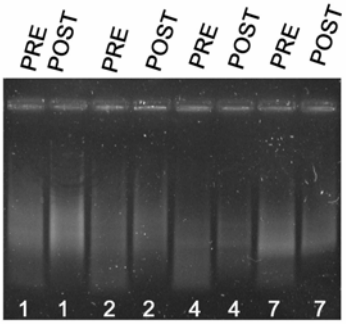
(IMAQUANIM)



Objective 13.1.1: Preparation of ESTs (expressed sequence tags)

- 9 primary cDNA libraries from challenged bivalves

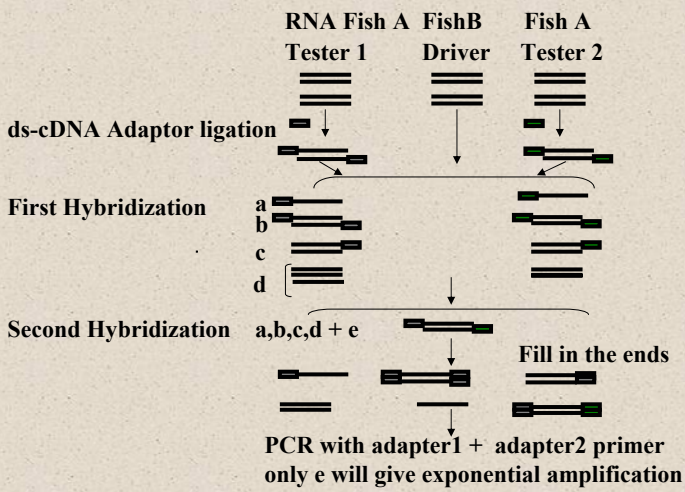
Digestive gland – Okadaic acid – Italy
Digestive gland and Gills – chemical contaminants - Italy
Haemolymph – control - Italy
Haemolymph – *Vibrio* – Italy
Haemolymph – *Vibrio* – Spain
Haemolymph – poly I:C – Spain
Gills – *Vibrio* – Italy
Digestive gland – *Vibrio* – Italy
Mixed tissues – *Vibrio* – Italy and Spain



Norwegian School of Veterinary Science

- Dr. Inderjit Singh Mercy, Norwegian School of Veterinary Science (Partner 2)

The Principal of Suppression Subtractive Hybridization

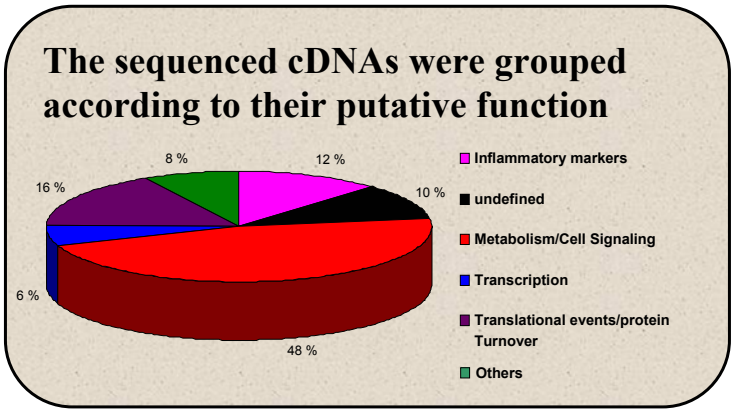


The Principal of SSH. Equal amounts of cDNA from Driver and Tester is used. The Driver serves as a reference while the Tester typically is the organ/cell-population of interest. By dividing the Tester cDNA in two and subsequently adding different adapters to these two a specific PCR amplification is facilitated after two rounds of elimination (hybridization with Driver). The PCR amplification should enrich the sequences specifically up-regulated in the Tester

Persistent infection

- The cells are persistently infected
  - Documented by the fact that the cell cultures could be cleared for virus by incubation with rabbit anti-IPNV
  - Sequencing of the virus from the supernatant reveals a *persistence signature* of the virus (TTTY and PTAY; Santi et al. 2005)
  - A minority of the cells in the culture is infected with the virus and
- We therefore consider that our libraries originate from the neighboring cells to the infected ones and we are looking at mechanisms in the neighboring cells that protect them from becoming infected

Grouping of transcripts by function



On-going work

- Confirm the in-vitro results with in-vivo analysis
- 3 out of 3 genes are confirmed being up-regulated both in-vivo and in-vitro